

IBM Docket No. JP920010065US1

REMARKS

Applicants respectfully request reconsideration of the Office Action mailed May 7, 2003. Claims 1-5 and 7-14 are presented for examination. Claim 6 has been canceled, and Claim 5 has been amended to incorporate the limitation of Claim 6. No new matter has been added.

Rejection of Claims 1-4 and 9-14 under 35 U.S.C. § 103(a) over Kobayashi et al.

Claims 1-4 and 9-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,757,447 to Kobayashi et al. Applicants respectfully traverse this rejection.

The present invention is directed to a display device, specifically a liquid crystal display device, which comprises a color filter substrate having color filter layers of red, green and blue, and a fluorescent light tube or backlight unit as a light source. It is a feature of this invention that the fluorescent light tube and the color filter layers have a relation such that a color reproduction region of light emitted from the fluorescent light tube through the color filter layers has an NTSC ratio of 85% or higher. Applicants respectfully submit that this feature (at least) is neither disclosed nor suggested by Kobayashi et al.

The Kobayashi et al. patent is directed to a fluorescent lamp for a color liquid crystal display device. In Figure 1, Kobayashi et al. describe a conventional fluorescent lamp wherein $Y_2O_3:Eu$ is used as the red-light emitting phosphor, $LaPO_4:Ce,Tb$ is used as the green-light emitting phosphor, and $BaMg_2Al_{16}O_{27}:Eu$ is used as the blue-light emitting phosphor (col. 1, line 66 – col. 2, line 10). This is the same conventional tri-phosphor fluorescent light tube which is discussed in the present application at page 3, lines 22-23. As discussed in the present application, use of this conventional fluorescent light tube in a liquid crystal display device does not result in

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Kobayashi further discloses a "new" fluorescent lamp wherein $M_3(PO_4):Sn,Mn$ is used as the red light emitting phosphor, where M is at least one of Sr, Mg, Ba, Ca, Zn and Ga (col. 6, lines 52-57). Each of the phosphors used in the Kobayashi fluorescent lamp are characterized by having a half value width of the light emitting peak wavelength in a range of 30 nm - 100 nm, thereby preventing the fringes which are caused by the interference of lights. However, use of the above tin-manganese-added activated orthophosphate phosphor as the red light emitting phosphor would result in an NTSC ratio which is even lower than the ratio obtained when the conventional fluorescent light tube is used. Therefore, Kobayashi et al. fail to disclose, and actually teach away from, a display device wherein the fluorescent light tube and the color filter layers have a relation such that a color reproduction region of light emitted from the fluorescent light tube through the color filter layers has an NTSC ratio of 85% or higher.

Accordingly, Applicants respectfully submit that Claims 1-4 and 9-14 are patentable over Kobayashi et al., and therefore request withdrawal of this rejection.

Rejection of Claims 5-8 under 35 U.S.C. § 103(a) over Kobayashi et al. in view of Kawamura

Claims 5-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kobayashi et al. in view of U.S. Patent No. 4,945,350 to Kawamura. Applicants respectfully traverse this rejection.

As discussed previously, it is a feature of the present invention that the cold cathode tubes and the color filter layers have a relation such that a color reproduction region of light emitted from the cold cathode tubes through the color filter layers has an NTSC ratio of 85% or higher. Applicants respectfully submit that this feature (at least) is neither disclosed nor suggested by Kobayashi et al. in view of Kawamura.

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As discussed previously, Kobayashi et al. fail to disclose, and actually teach away from, a liquid crystal display device wherein the cold cathode tubes and the color filter layers have a relation such that a color reproduction region of light emitted from the cold cathode tubes through the color filter layers has an NTSC ratio of 85% or higher. Kawamura fail to remedy the deficiencies of the Kobayashi et al. patent in this regard. The Kawamura patent is directed to a liquid crystal display device. However, Kawamura fails to disclose anything about the light emitting phosphors which are used in the fluorescent lamp(s) of this display device. Therefore, Kawamura fails to provide any motivation to modify the teaching of Kobayashi et al. to provide a display device wherein the cold cathode tubes and the color filter layers have a relation such that a color reproduction region of light emitted from the cold cathode tubes through the color filter layers has an NTSC ratio of 85% or higher.

Accordingly, Applicants respectfully submit that Claims 5-8 are patentable over Kobayashi et al. in view of Kawamura, and therefore request withdrawal of this rejection.

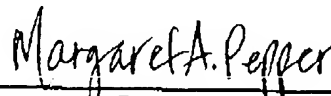
Conclusion

Applicants have properly traversed each of the grounds for rejection in the Office Action, and therefore submit that the present application is now in condition for allowance. If the Examiner has any questions or believes further discussion will aid examination and advance prosecution of the application, a telephone call to the undersigned is invited.

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A fee of \$110.00 is believed to be due for the submission of this amendment. The Commissioner is authorized to charge this fee, and any other required fees, to Deposit Account No. 09-0458.

Respectfully Submitted,



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